

**TRANSLATION**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>0000054969</b>	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/011642</b>	International filing date (day/month/year) <b>15.10.2004</b>	Priority date (day/month/year) <b>17.10.2003</b>	
International Patent Classification (IPC) or national classification and IPC <b>C07C209/36, B01J23/89</b>			
Applicant <b>BASF Aktiengesellschaft</b>			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <b>5</b> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <b>1</b> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/011642

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 

This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
 
  - international search (Rule 12.3 and 23.1(b))
  - publication of the international application (Rule 12.4)
  - international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
 

the international application as originally filed/furnished

the description:
 

pages 1-9 as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:
 

nos. \_\_\_\_\_ as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19 01.04.2005 with letter of 30.03.2005

nos.\* 1-11 received by this Authority on \_\_\_\_\_

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:
 

sheets \_\_\_\_\_ as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3.  The amendments have resulted in the cancellation of:
 

the description, pages \_\_\_\_\_

the claims, nos. \_\_\_\_\_

the drawings, sheets/figs \_\_\_\_\_

the sequence listing (*specify*): \_\_\_\_\_

any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 

the description, pages \_\_\_\_\_

the claims, nos. \_\_\_\_\_

the drawings, sheets/figs \_\_\_\_\_

the sequence listing (*specify*): \_\_\_\_\_

any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/EP2004/011642

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1-11	YES
	Claims		NO
Inventive step (IS)	Claims	1-11	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-11	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

This report makes reference to the following documents:

D1: YASUYUKI MATSUMURA ET AL.: "Synergic Effect of Nickel and Platinum Supported on Silicia in Catalytic Methanol Decomposition", CHEMICAL COMMUNICATIONS - CHEMCOM., 1997, XP002315664, GB ROYAL SOCIETY OF CHEMISTRY

D2: A. J. RENOUPREZ ET AL.: "Catalytic Activity of Alumina Supported Platinum-Nickel Alloys", STUDIES IN SURFACE SCIENCE AND CATALYSIS, 1981, pages 173-185, XP008042149

D3: EP-A-0 595 124 (BAYER AG), 4 May 1994 (1994-05-04)

### 1. Novelty

The present application meets the requirements of PCT Article 33(1) because the subject matter of claims 1-9, 10 and 11 is novel (PCT Article 33(2)).

Claims 1-9 disclose a method for hydrogenating aromatic nitro compounds characterised in that a nickel-platinum **alloy** with an **atomic ratio** of nickel to platinum in the alloy ranging from **30:70 to 70:30** is used as a supported catalyst.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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PCT/EP2004/011642Box No. V      **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Claim 10 claims the catalysts preferably used in the above method. They are characterised in that active carbon, soot or graphite are used as support. Claim 11 claims the use of these preferred catalysts for hydrogenating dinitrotoluene.

Document D1 (see D1, the entire document, in particular table 1 on page 657) describes nickel-platinum alloys with different nickel and platinum contents on a  $\text{SiO}_2$  support, and their use as catalysts for decomposing methanol into carbon monoxide and hydrogen. D1 does not mention active carbon, soot or graphite as support materials, nor does it mention the hydrogenation of aromatic nitro compounds. The subject matter of claims 1-11 is therefore novel over D1.

Document D2 (see D2, pages 173-182) describes nickel-platinum alloys with different nickel and platinum contents on an aluminium oxide support, and their use as catalysts for the hydrogenolysis of neopentane. The subject matter of claims 1-11 is thus also novel over D2, since D2 does not mention active carbon, soot or graphite as support material, nor describes the hydrogenation of aromatic nitro compounds.

Document D3 describes a method for hydrogenating aromatic nitro compounds in the presence of a supported catalyst which contains platinum and nickel, but these two metals are not present in the catalyst as an alloy. The subject matter of claims 1-11 is therefore also novel over document D3.

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

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**2. Inventive step**

The present application further meets the requirements of PCT Article 33(1) because the subject matter of claims 1-11 involves an inventive step (PCT Article 33(3)).

In relation to document D3, which is considered to represent the closest prior art, claims 1-9 and 11 can be considered to address the problem of devising an improved method for hydrogenating aromatic nitro compounds. In order to solve this problem, the applicant proposes the method defined in claims 1-9, which differs from the method described in D3 in that a nickel-platinum alloy with an atomic ratio of nickel to platinum in the alloy ranging from 30:70 to 70:30 is used as a supported catalyst. In comparison with a catalyst in which nickel and platinum are present as discrete particles, rather than as an alloy, the catalyst according to the invention shows a surprisingly high selectivity, even at high temperatures. The method as per claims 1-9, and the use as per claim 11 of a nickel-platinum alloy as a supported catalyst for the hydrogenation of dinitrotoluene, are therefore considered inventive. Since the method as such is considered inventive, the catalysts as per claim 10, which are preferably used in this method, also involve an inventive step.

**3. Industrial applicability**

The subject matter of claims 1-11 is industrially applicable.